

SEQUENCE LISTING

<110> Anderson, Marie
Fisher, Stewart
Folmer, Rutger
Lindqvist, Thomas
Xue, Yafeng
Newton, David
Kern, Gunther

<120> CRYSTAL STRUCTURE OF GLUTAMATE RACEMASE (MURI)

<130> 100966

<140> 10/729,571

<141> 2003-05-12

<150> US 60/435,087

<151> 2002-12-20

<150> US 60/435,527

<151> 2002-12-20

<150> US 60/435,167

<151> 2002-12-20

<150> US 60/435,272

<151> 2002-12-20

<160> 97

<170> PatentIn version 3.3

<210> 1

<211> 32

<212> PRT

<213> Staphylococcus aureus

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<210> 2

<211> 256

<212> PRT

<213> Helicobacter pylori

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<221> misc_feature

<222> (256)..(256)

<223> Xaa can be any naturally occurring amino acid

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Lys	Ser	Leu	Leu	Lys	Ala	Arg	Leu	Phe	Asp	Glu	Ile	Ile	Tyr	Tyr	Gly
		20						25					30		

Asp	Ser	Ala	Arg	Val	Pro	Tyr	Gly	Thr	Lys	Asp	Pro	Thr	Thr	Ile	Lys
		35					40					45			

Gln	Phe	Gly	Leu	Glu	Ala	Leu	Asp	Phe	Phe	Lys	Pro	His	Glu	Ile	Glu
	50					55					60				

Leu	Leu	Ile	Val	Ala	Cys	Asn	Thr	Ala	Ser	Ala	Leu	Ala	Leu	Glu	Glu
65					70					75					80

Met	Gln	Lys	Tyr	Ser	Lys	Ile	Pro	Ile	Val	Gly	Val	Ile	Glu	Pro	Ser
				85					90					95	

Ile	Leu	Ala	Ile	Lys	Arg	Gln	Val	Glu	Asp	Lys	Asn	Ala	Pro	Ile	Leu
			100					105					110		

Val	Leu	Gly	Thr	Lys	Ala	Thr	Ile	Gln	Ser	Asn	Ala	Tyr	Asp	Asn	Ala
		115					120					125			

Leu	Lys	Gln	Gln	Gly	Tyr	Leu	Asn	Ile	Ser	His	Leu	Ala	Thr	Ser	Leu
	130					135					140				

Phe	Val	Pro	Leu	Ile	Glu	Glu	Ser	Ile	Leu	Glu	Gly	Glu	Leu	Leu	Glu
145					150					155					160

Thr	Cys	Met	His	Tyr	Tyr	Phe	Thr	Pro	Leu	Glu	Ile	Leu	Pro	Glu	Val
				165					170					175	

Ile	Ile	Leu	Gly	Cys	Thr	His	Phe	Pro	Leu	Ile	Ala	Gln	Lys	Ile	Glu
			180					185					190		

Gly	Tyr	Phe	Met	Gly	His	Phe	Ala	Leu	Pro	Thr	Pro	Pro	Leu	Leu	Ile
		195					200					205			

His	Ser	Gly	Asp	Ala	Ile	Val	Glu	Tyr	Leu	Gln	Gln	Lys	Tyr	Ala	Leu
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210

215

220

Lys Asn Asn Ala Cys Thr Phe Pro Lys Val Glu Phe His Ala Ser Gly
 225 230 235 240

Asp Val Ile Trp Leu Glu Arg Gln Ala Lys Glu Trp Leu Lys Leu Xaa
 245 250 255

<210> 3
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 actaaagacc ccactacgat caagcaatth ggcttagagg ctttggattt tttcaaacca 180
 caccagattg aattattgat tgtggcatgc aacaccgcaa gcgctctggc tttagaagag 240
 atgcaaaagc attccaaaat ccctattgtg ggcgtgattg agccaagcat tttagcgatc 300
 aagcaacaag tgaaagataa aaacgcccct attttagtgc tagggacaaa agcgacgatt 360
 caatccaacg cttatgacaa cgccctgaaa caacaaggct atttgaatgt ttcgcattta 420
 gccacttctc tttttgtgcc tttgattgaa gaaagtattt tagagggcga attgttagag 480
 acttgcattg gttattattt cactccctta aagattttac ctgaagtgat tatttttaggt 540
 tgcacgcatt ttcccttgat tgctcaaaaa attgagggct atttcatgga gcattttgcc 600
 cttccaacgc cccccctact catccattcg ggcgatgcta ttgtagaata tttgcagcaa 660
 aaatacgccc ttaaaaacaa tgcacacgca ttccctaaag tggaatttca tgcgagcggc 720
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 <223> Xaa can be any naturally occurring amino acid

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Lys	Ser	Leu	Leu	Lys	Ala	Gln	Leu	Phe	Asp	Glu	Ile	Ile	Tyr	Tyr	Gly	20	25	30	
Asp	Ser	Ala	Arg	Val	Pro	Tyr	Gly	Thr	Lys	Asp	Pro	Thr	Thr	Ile	Lys	35	40	45	
Gln	Phe	Gly	Leu	Glu	Ala	Leu	Asp	Phe	Phe	Lys	Pro	His	Gln	Ile	Glu	50	55	60	
Leu	Leu	Ile	Val	Ala	Cys	Asn	Thr	Ala	Ser	Ala	Leu	Ala	Leu	Glu	Glu	65	70	75	80
Met	Gln	Lys	His	Ser	Lys	Ile	Pro	Ile	Val	Gly	Val	Ile	Glu	Pro	Ser	85	90	95	
Ile	Leu	Ala	Ile	Lys	Gln	Gln	Val	Lys	Asp	Lys	Asn	Ala	Pro	Ile	Leu	100	105	110	
Val	Leu	Gly	Thr	Lys	Ala	Thr	Ile	Gln	Ser	Asn	Ala	Tyr	Asp	Asn	Ala	115	120	125	
Leu	Lys	Gln	Gln	Gly	Tyr	Leu	Asn	Val	Ser	His	Leu	Ala	Thr	Ser	Leu	130	135	140	
Phe	Val	Pro	Leu	Ile	Glu	Glu	Ser	Ile	Leu	Glu	Gly	Glu	Leu	Leu	Glu	145	150	155	160
Thr	Cys	Met	Arg	Tyr	Tyr	Phe	Thr	Pro	Leu	Lys	Ile	Leu	Pro	Glu	Val	165	170	175	
Ile	Ile	Leu	Gly	Cys	Thr	His	Phe	Pro	Leu	Ile	Ala	Gln	Lys	Ile	Glu	180	185	190	
Gly	Tyr	Phe	Met	Glu	His	Phe	Ala	Leu	Pro	Thr	Pro	Pro	Leu	Leu	Ile	195	200	205	
His	Ser	Gly	Asp	Ala	Ile	Val	Glu	Tyr	Leu	Gln	Gln	Lys	Tyr	Ala	Leu	210	215	220	
Lys	Asn	Asn	Ala	His	Ala	Phe	Pro	Lys	Val	Glu	Phe	His	Ala	Ser	Gly				

225		230		235		240
Asp	Val	Ile	Trp	Leu	Glu	Arg
				Gln	Ala	Lys
				Glu	Trp	Leu
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 actaaagacc ccactacgat caagcaattt ggcttagagg ctttggattt tttcaaaccg 180
 caccagattg aattattgat tgtggcatgc aacacagcga gcgctctagc tttagaagag 240
 atgcaaaagc attccaaaat ccctattgtg ggcgtgattg agccaagcat tttagcgatc 300
 aagcgacaag taaaagataa aaacgcccct attttagtgc tagggacaaa agcgacgatc 360
 caatccaacg cttatgacaa tgccctgaaa caacaaggct atttgaatgt ttcgcattta 420
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Lys	Ser	Leu	Leu	Lys	Ala	Gln	Leu	Phe	Asp	Glu	Ile	Ile	Tyr	Tyr	Gly	
		20						25					30			
Asp	Ser	Ala	Arg	Val	Pro	Tyr	Gly	Thr	Lys	Asp	Pro	Thr	Thr	Ile	Lys	
		35					40					45				
Gln	Phe	Gly	Leu	Glu	Ala	Leu	Asp	Phe	Phe	Lys	Pro	His	Gln	Ile	Glu	
	50					55					60					
Leu	Leu	Ile	Val	Ala	Cys	Asn	Thr	Ala	Ser	Ala	Leu	Ala	Leu	Glu	Glu	
65					70					75					80	
Met	Gln	Lys	His	Ser	Lys	Ile	Pro	Ile	Val	Gly	Val	Ile	Glu	Pro	Ser	
				85					90					95		
Ile	Leu	Ala	Ile	Lys	Arg	Gln	Val	Lys	Asp	Lys	Asn	Ala	Pro	Ile	Leu	
			100					105					110			
Val	Leu	Gly	Thr	Lys	Ala	Thr	Ile	Gln	Ser	Asn	Ala	Tyr	Asp	Asn	Ala	
		115					120					125				
Leu	Lys	Gln	Gln	Gly	Tyr	Leu	Asn	Val	Ser	His	Leu	Ala	Thr	Ser	Leu	
	130					135					140					
Phe	Val	Pro	Leu	Ile	Glu	Glu	Ser	Ile	Leu	Glu	Gly	Glu	Leu	Leu	Glu	
145					150					155					160	
Thr	Cys	Met	Arg	Tyr	Tyr	Phe	Thr	Pro	Leu	Lys	Ile	Leu	Pro	Glu	Val	
				165					170					175		
Ile	Ile	Leu	Gly	Cys	Thr	His	Phe	Pro	Leu	Ile	Ala	Gln	Lys	Ile	Glu	
			180					185					190			
Gly	Tyr	Phe	Met	Glu	His	Phe	Ala	Leu	Ser	Thr	Pro	Pro	Leu	Leu	Ile	
		195					200					205				
His	Ser	Gly	Asp	Ala	Ile	Val	Gly	Tyr	Leu	Gln	Gln	Lys	Tyr	Ala	Leu	
	210					215					220					
Lys	Lys	Asn	Ala	His	Ala	Phe	Pro	Lys	Val	Glu	Phe	His	Ala	Ser	Gly	
225					230					235					240	
Asp	Val	Ile	Trp	Leu	Glu	Lys	Gln	Ala	Lys	Glu	Trp	Leu	Lys	Leu	Xaa	

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250

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actaaagacc ccaccacgat caagcaatth ggcttagagg ctttggaattt tttcaaaccg      180
caccagatta aattattgat tgtggcatgc aacacagcga gcgctctagc tttagaagag      240
atgcaaaagc attccaaaat ccctattgtg ggcgtgattg agccaagcat tttagcgatc      300
aagcaacaag taaaagataa aaacgcccct atttttagtgc tagggacaaa agcgacgatc      360
caatccaacg cttatgacaa cgccctgaaa caacaaggct atttgaatgt ttcgcattta      420
gccacttctc tttttgtgcc tttgattgaa gaaagtattt tagggggcga attgttagaa      480
acttgcattg gttattattt cactccctta aagattttac ctgaagtgat tatttttaggt      540
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ctttcaacgc cccccctact catccattcg ggcgatgcta ttgtggaata tttgcagcaa      660
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<210> 8

<211> 249

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<213> *Helicobacter pylori*

<400> 8

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Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
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Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
20           25           30

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Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
35           40           45

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Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Lys
50           55           60

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Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65 70 75 80

Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
85 90 95

Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
100 105 110

Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
115 120 125

Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
130 135 140

Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Gly Gly Glu Leu Leu Glu
145 150 155 160

Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
165 170 175

Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
180 185 190

Gly Tyr Phe Met Glu His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
195 200 205

His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220

Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

Asp Val Ile Trp Leu Glu Lys Gln Ala
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<210> 9

<211> 768

<212> DNA

<213> Helicobacter pylori

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caccagattg gattattgat tgtggcatgc aacacagcga gcgctctagc tttagaagag 240
atgcaaaagc attccaaaat ccctattgtg ggcgtgattg aaccaagcat tttagcgatc 300
aagcaacaag taaaagataa aaacgcctct attttggtgc tagggacaaa agcgacgatc 360
caatccaacg cttatgacaa cgccctgaaa caacaaggct atttgaatgt ttcgcattta 420
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acttgcacgc gttattattt cactccgtta gagatcttgc ctgaagtggc tatttttaggt 540
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<210> 10
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<213> Helicobacter pylori

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<223> Xaa can be any naturally occurring amino acid

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<400> 10

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Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
1           5           10           15

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Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
          20           25           30

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Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
          35           40           45

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Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Gly
          50           55           60

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Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65           70           75           80

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Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
85 90 95

Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Ser Ile Leu
100 105 110

Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
115 120 125

Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
130 135 140

Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
145 150 155 160

Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
165 170 175

Val Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
180 185 190

Gly Tyr Phe Met Glu His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
195 200 205

His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220

Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu Xaa
245 250 255

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<212> DNA
<213> Helicobacter pylori

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actaaagacc ccaccacgat caagcaattt ggcttagagg ctttggattt tttcaaaccg 180

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caccagatta aattattgat tgtggcatgc aacacagcga gcgctctagc tttagaagag      240
atgcaaaagc attccaaaat ccctattgtg ggcgtgattg agccaagcat tttagcgatc      300
aagcaacaag taaaagataa aaacgcccct attttagtgc tagggacaaa agcgacgatt      360
caatctaacg cttatgacaa cgccctaaaa caacaaggct atttgaacat ttcgcattta      420
gccacttctc tttttgtgcc tttgattgaa gaaagtattt tagagggcga attgttagag      480
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tgcacgcatt ttcccttgat cgctcaaaaa attgagggct attttatgga gcattttgcc      600
cttccaaccc cccccctact catccattcg ggcgatgcta ttgtagaata tttgcagcaa      660
aaatacacc c ttaagaaaaa tgcacacgca ttccctaaag tggaatttca tgcgagtggc      720
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Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
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Lys Ser Leu Leu Lys Ala Gln Ile Phe Asp Glu Ile Ile Tyr Tyr Gly
          20           25           30

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Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
          35           40           45

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Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Lys
          50           55           60

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Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65           70           75           80

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Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
          85           90           95

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Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
          100          105          110

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Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
115 120 125

Leu Lys Gln Gln Gly Tyr Leu Asn Ile Ser His Leu Ala Thr Ser Leu
130 135 140

Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
145 150 155 160

Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
165 170 175

Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
180 185 190

Gly Tyr Phe Met Glu His Phe Ala Leu Pro Thr Pro Pro Leu Leu Ile
195 200 205

His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Thr Leu
210 215 220

Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

Asp Val Val Trp Leu Glu Lys Gln Ala
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actaaagacc ccaccacgat caagcaattt ggcttagagg ctttggattt tttcaaaccg 180
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<210> 14
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<400> 14

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 35 40 45

Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Gly
 50 55 60

Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
 65 70 75 80

Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
 85 90 95

Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
 100 105 110

Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
 115 120 125

Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
130 135 140

Phe Val Pro Leu Ile Glu Glu Asn Ile Leu Glu Gly Glu Leu Leu Glu
145 150 155 160

Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
165 170 175

Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
180 185 190

Gly Tyr Phe Met Glu His Phe Ala Leu Leu Thr Pro Pro Leu Leu Ile
195 200 205

His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220

Lys Lys Asn Ala His Ser Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu Xaa
245 250 255

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<213> Helicobacter pylori

<400> 15
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aaagcgcaaa tttttgatga aatcatctat tatggcgata gcgctagagt gccttatggc 120
actaaagacc ccaccacgat caagcaattt ggcttagagg ctttggattt tttcaaaccg 180
caccagattg aattattgat tgtggcatgc aacacagcga gcgctctagc tttagaagag 240
atgcaaaagc attccaaaat ccctattgtg ggcgtgattg aaccaagcat tttagcgatc 300
aaacaacaag tgaaagataa aaacgctcct attttagtgc tagggacaaa agcgacgatt 360
caatctaacg cttacgacaa cgccctgaaa caacaaggct atttgaatgt ttcgcattta 420
gccacttctc tttttgtgcc tttgattgaa gaaagtatth tagagggcga attgctagaa 480
acttgcattg gttattatth cactccctta aagattttac ccaaagtaat catttttaggt 540
tgcacgcatt ttcccttgat cgctcaccaa attaagggtc attttatggg gcattttgcc 600

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ctttcaacgc cccccctact catccattcg ggcgatgcta ttgtgggata ttgcaacaa      660
aaatacgccc ttaagaaaaa tgcacacgca ttccctaaag tggaatttca tgcgagcggc      720
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<210> 16
<211> 256
<212> PRT
<213> Helicobacter pylori

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<220>
<221> misc_feature
<222> (256)..(256)
<223> Xaa can be any naturally occurring amino acid

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<400> 16

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Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
1           5           10           15

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Lys Ser Leu Leu Lys Ala Gln Ile Phe Asp Glu Ile Ile Tyr Tyr Gly
          20           25           30

```

```

Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
          35           40           45

```

```

Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Glu
          50           55           60

```

```

Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65           70           75           80

```

```

Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
          85           90           95

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```

Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
          100          105          110

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```

Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
          115          120          125

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Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
          130          135          140

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Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
145 150 155 160

Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Lys Val
165 170 175

Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala His Gln Ile Lys
180 185 190

Gly Tyr Phe Met Gly His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
195 200 205

His Ser Gly Asp Ala Ile Val Gly Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220

Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu Xaa
245 250 255

<210> 17
<211> 768
<212> DNA
<213> Helicobacter pylori

<400> 17
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aaagcgcaat tatttgatga aatcatctat tatggcgata gcgctagagt gccttatggc 120
actaaagacc ccaccacgat caagcaattt ggcttagagg ctttgattt tttcaaaccg 180
caccagatta aattattgat tgtggcatgc aacacagcga gtgctctggc tttagaagag 240
atgcaaaagc attccaaaat ccctattgtg ggcgtgattg agccaagcat tttagcgatc 300
aaacaacagg taaaagataa aaacgcccc attttagtgc taggcacaaa agcgacgatt 360
caatctaacg cttacgataa cgctctgaaa cgacaaggct atttgaacgt ttcgcattta 420
gccacttccc tttttgtgcc tttgattgaa gaaagtattt tagagggcga attgttagaa 480
acttgcatgc gttattattt cactccctta aagattttac ctgaagtgat catttttaggt 540
tgtacgcatt ttcccttgat cgctcaaaaa attgagggct attttatgga acattttgcc 600
tttccaacgc cccccctact catccattcg ggcgatgcta ttgtggaata tttgcagcaa 660
aaatacgccc ttaagaaaaa tgcacacgca ttacctaaag tggaatttca tgcgagcggc 720

gatgtgatct ggctagaaaa acaagctaaa gaatggctca aattgtaa

768

<210> 18
<211> 256
<212> PRT
<213> Helicobacter pylori

<220>
<221> misc_feature
<222> (256)..(256)
<223> Xaa can be any naturally occurring amino acid

<400> 18

Met	Lys	Ile	Gly	Val	Phe	Asp	Ser	Gly	Val	Gly	Gly	Phe	Ser	Val	Leu
1				5					10					15	

Lys	Ser	Leu	Leu	Lys	Ala	Gln	Leu	Phe	Asp	Glu	Ile	Ile	Tyr	Tyr	Gly
		20						25					30		

Asp	Ser	Ala	Arg	Val	Pro	Tyr	Gly	Thr	Lys	Asp	Pro	Thr	Thr	Ile	Lys
		35					40					45			

Gln	Phe	Gly	Leu	Glu	Ala	Leu	Asp	Phe	Phe	Lys	Pro	His	Gln	Ile	Lys
	50					55					60				

Leu	Leu	Ile	Val	Ala	Cys	Asn	Thr	Ala	Ser	Ala	Leu	Ala	Leu	Glu	Glu
65					70					75					80

Met	Gln	Lys	His	Ser	Lys	Ile	Pro	Ile	Val	Gly	Val	Ile	Glu	Pro	Ser
				85					90					95	

Ile	Leu	Ala	Ile	Lys	Gln	Gln	Val	Lys	Asp	Lys	Asn	Ala	Pro	Ile	Leu
		100						105					110		

Val	Leu	Gly	Thr	Lys	Ala	Thr	Ile	Gln	Ser	Asn	Ala	Tyr	Asp	Asn	Ala
		115					120					125			

Leu	Lys	Arg	Gln	Gly	Tyr	Leu	Asn	Val	Ser	His	Leu	Ala	Thr	Ser	Leu
	130						135				140				

Phe	Val	Pro	Leu	Ile	Glu	Glu	Ser	Ile	Leu	Glu	Gly	Glu	Leu	Leu	Glu
145					150					155					160

Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
165 170 175

Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
180 185 190

Gly Tyr Phe Met Glu His Phe Ala Phe Pro Thr Pro Pro Leu Leu Ile
195 200 205

His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220

Lys Lys Asn Ala His Ala Leu Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu Xaa
245 250 255

<210> 19
<211> 768
<212> DNA
<213> Helicobacter pylori

<400> 19
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aaagcgcaat tatttgatga aatcatctat tatggcgata gcgctagagt gccttatggc 120
actaaagacc ccaccacgat caagcaattt ggcttagagg ctttggattt tttcaaaccg 180
caccagatta aattattgat tgtggcatgc aacacagcga gcgctctagc tttagaagag 240
atgcaaaagc attccaaaat ccctattgtg ggcgtgattg agccaagcat tttagcgatc 300
aaacaacaag taaaggataa aaacgcccc atttttagtgc tagggacaaa agcgacgatt 360
caatctaacg cttacgataa cgctctgaaa caacaaggct atttgaacgt ttcgcattta 420
gccacttctc tttttgtgcc tttgattgaa gaaaatattt tagagggcga attgttagaa 480
acttgcacgc gttattattt cactccctta gagattttac ctgaagtgat catttttaggt 540
tgcacgcatt ttcccttaat cgctcaaaaa attgagggct atttcatggg gcattttgcc 600
cttccaacgc ccccatact catccattct ggcgacgcta ttgtagaata tttgcaacaa 660
aaatacgccc ttaagaaaaa tgcacacgca ttccctaaag tggaatttca tgcgagcggc 720
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<210> 20
<211> 256
<212> PRT
<213> Helicobacter pylori

<220>
<221> misc_feature
<222> (256)..(256)
<223> Xaa can be any naturally occurring amino acid

<400> 20

Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
1 5 10 15

Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
20 25 30

Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
35 40 45

Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Lys
50 55 60

Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65 70 75 80

Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
85 90 95

Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
100 105 110

Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
115 120 125

Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
130 135 140

Phe Val Pro Leu Ile Glu Glu Asn Ile Leu Glu Gly Glu Leu Leu Glu
145 150 155 160

Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
165 170 175

Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
180 185 190

Gly Tyr Phe Met Gly His Phe Ala Leu Pro Thr Pro Pro Ile Leu Ile
195 200 205

His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220

Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

Asp Met Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu Xaa
245 250 255

<210> 21
<211> 768
<212> DNA
<213> Helicobacter pylori

<400> 21
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actaaagacc ccaccacgat caagcaattt ggcttagagg ctttgattt tttcaaaccg 180
caccagatta aattattgat tgtagcatgc aacacagcga gcgctctagc tttagaagag 240
atgcaaaagc attccaaaat ccctattgtg ggcgtgattg agccaagcat tttagcgatc 300
aaacaacaag taaaagataa aaacgcccct attttagtgc tagggacaaa agcgacgatt 360
caatctaacg cttatgacaa cgccctgaaa caacaaggct atttgaatgt ttcgcattta 420
gccacttctc tttttgtgcc tttgattgaa gaaagtatth tagagggcga attgttagaa 480
acttgcacgc gttattatth cactccctta aagatthttac ctgaagtgat tattthtaggt 540
tgcacgcatt ttccttgat cgctcaaaaa attgagagct atthttatggg gcattthtggc 600
cttccaacgc cccccctact catccattct ggcgatgcta ttgtggaata tttgcagcaa 660
aaatacgccc ttaagaaaaa cgcacacgca ttccctaaag tggaatttca tgcgagcggc 720
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<210> 22
<211> 256
<212> PRT
<213> Helicobacter pylori

<220>
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<222> (256)..(256)
<223> Xaa can be any naturally occurring amino acid

<400> 22

Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
1 5 10 15

Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
20 25 30

Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
35 40 45

Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Lys
50 55 60

Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65 70 75 80

Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
85 90 95

Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
100 105 110

Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
115 120 125

Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
130 135 140

Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
145 150 155 160

Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
165 170 175

Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
180 185 190

Ser Tyr Phe Met Gly His Phe Ala Leu Pro Thr Pro Pro Leu Leu Ile
195 200 205

His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220

Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu Xaa
245 250 255

<210> 23
<211> 768
<212> DNA
<213> Helicobacter pylori

<400> 23
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aaagcgcaac tatttgatga aatcatctat tatggcgata gcgctagagt gccttatggc 120
actaaagacc ccaccacgat caagcaatth ggcttagagg ctttggattt tttcaaaccg 180
caccagattg gattattgat tgtggcatgc aacacagcga gcgctctggc tttagaagag 240
atgcaaaaat attccaaaat ccctattgtg ggcgtgattg agccaagcat tttagcgatc 300
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caatctaacg cttatgataa cgccctgaaa caacaaggct atttgaacat ttcgcattta 420
gccacttctc tttttgtgcc cttgattgaa gaaagtattt tagagggcga attgttagaa 480
acttgcattg gttattattt cactccatta gagattttac ctgaagtgat catttttaggt 540
tgcacgcatt ttcccttgat cgctcaaaaa attgagagct attttatgga gcattttgcc 600
ctttcaacgc ccccttact catccattct ggcgatgcta ttgtggaata cttgcaacaa 660
aaatacgccc ttaagaaaaa cgcacacgca ttccctaaag tggaatttca tgcgagcggc 720
gatgtgatct ggctagaaaa acaggctaaa gaatggctca aattgtaa 768

<210> 24
<211> 256
<212> PRT
<213> Helicobacter pylori

<220>
<221> misc_feature

<222> (256)..(256)

<223> Xaa can be any naturally occurring amino acid

<400> 24

Met	Lys	Ile	Gly	Val	Phe	Asp	Ser	Gly	Val	Gly	Gly	Phe	Ser	Val	Leu
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Lys	Ser	Leu	Leu	Lys	Ala	Gln	Leu	Phe	Asp	Glu	Ile	Ile	Tyr	Tyr	Gly
		20						25					30		

Asp	Ser	Ala	Arg	Val	Pro	Tyr	Gly	Thr	Lys	Asp	Pro	Thr	Thr	Ile	Lys
		35					40					45			

Gln	Phe	Gly	Leu	Glu	Ala	Leu	Asp	Phe	Phe	Lys	Pro	His	Gln	Ile	Gly
	50					55					60				

Leu	Leu	Ile	Val	Ala	Cys	Asn	Thr	Ala	Ser	Ala	Leu	Ala	Leu	Glu	Glu
65					70					75					80

Met	Gln	Lys	Tyr	Ser	Lys	Ile	Pro	Ile	Val	Gly	Val	Ile	Glu	Pro	Ser
				85					90					95	

Ile	Leu	Ala	Ile	Lys	Gln	Gln	Val	Lys	Asp	Lys	Asn	Ala	Pro	Ile	Leu
			100					105						110	

Val	Leu	Gly	Thr	Lys	Ala	Thr	Ile	Gln	Ser	Asn	Ala	Tyr	Asp	Asn	Ala
		115					120						125		

Leu	Lys	Gln	Gln	Gly	Tyr	Leu	Asn	Ile	Ser	His	Leu	Ala	Thr	Ser	Leu
	130					135					140				

Phe	Val	Pro	Leu	Ile	Glu	Glu	Ser	Ile	Leu	Glu	Gly	Glu	Leu	Leu	Glu
145					150					155					160

Thr	Cys	Met	Arg	Tyr	Tyr	Phe	Thr	Pro	Leu	Glu	Ile	Leu	Pro	Glu	Val
				165					170					175	

Ile	Ile	Leu	Gly	Cys	Thr	His	Phe	Pro	Leu	Ile	Ala	Gln	Lys	Ile	Glu
			180					185					190		

Ser	Tyr	Phe	Met	Glu	His	Phe	Ala	Leu	Ser	Thr	Pro	Pro	Leu	Leu	Ile
			195				200					205			

His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220

Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu Xaa
245 250 255

<210> 25
<211> 768
<212> DNA
<213> Helicobacter pylori

<400> 25
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actaaagacc ccaccacgat caagcaatth ggcttagagg ctttggtattt tttcaaaccg 180
cacaaaattg aattattaat tgtggcatgc aacacagcga gcgctctggc tttagaagag 240
atgcaaaagc attccaaaat cccattgtg ggcggtgattg agccaagcat tttagcgatc 300
aaacaacaag tgaaagataa aaacaccctt attttagtgc tagggacaaa agcgacgatc 360
caatctaacg cttacgataa cgccctgaaa caacaaggct atttgaagggt ttcgcatttg 420
gccacttctc tttttgtgcc tttgattgaa gaaagtattt tagagggcga attgttagaa 480
acttgcatgc gttattattt cactccatta gaaatcttac ctgaagtgggt tatttttaggc 540
tgcacgcatt ttcccttgat cgctcaaaaa attgagggct attttatgga acattttgcc 600
cttccaacgc cccccctact catccattct ggcgacgcta ttgtgggata tttgcagcaa 660
aaatacgccc ttaagaaaaa cgcacacgca ttccctaaag tggaatttca tgcgagcggc 720
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<210> 26
<211> 256
<212> PRT
<213> Helicobacter pylori

<220>
<221> misc_feature
<222> (256)..(256)
<223> Xaa can be any naturally occurring amino acid
<400> 26

Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
1 5 10 15

Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
20 25 30

Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
35 40 45

Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Lys Ile Glu
50 55 60

Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65 70 75 80

Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
85 90 95

Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Thr Pro Ile Leu
100 105 110

Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
115 120 125

Leu Lys Gln Gln Gly Tyr Leu Lys Val Ser His Leu Ala Thr Ser Leu
130 135 140

Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
145 150 155 160

Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
165 170 175

Val Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
180 185 190

Gly Tyr Phe Met Glu His Phe Ala Leu Pro Thr Pro Pro Leu Leu Ile
195 200 205

His Ser Gly Asp Ala Ile Val Gly Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220

Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
 225 230 235 240

Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu Xaa
 245 250 255

<210> 27
 <211> 768
 <212> DNA
 <213> Helicobacter pylori

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 actaaagacc ccaccacgat caagcaattt ggcttagagg ctttggaattt tttcaaaccg 180
 cacaagattg aattattgat tgtggcatgc aacacagcga gcgctctagc tttagaagaa 240
 atgcaaaaagc attccaaaat ccctattgtg ggcgtgattg aaccaagcat tttagcgatc 300
 aaacaacaag taaaagataa aaacgcccct attttagtgc tagggacaaa agcgacgatt 360
 caatctaacg cttatgacaa cgccctgaaa caacaaggct atttgaatgt ttgcgattta 420
 gccacttctc tttttgtgcc tttgattgaa gaaaatattt tagagggcga attgctagaa 480
 acttgcatgc gttattattt cactccatta gagatcttgc ctgaagtggg tatttttaggc 540
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<210> 28
 <211> 256
 <212> PRT
 <213> Helicobacter pylori

<220>
 <221> misc_feature
 <222> (256)..(256)
 <223> Xaa can be any naturally occurring amino acid
 <400> 28

Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
 1 5 10 15

Lys	Ser	Leu	Leu	Lys	Ala	Gln	Ile	Phe	Asp	Glu	Ile	Ile	Tyr	Tyr	Gly	20	25	30
Asp	Ser	Ala	Arg	Val	Pro	Tyr	Gly	Thr	Lys	Asp	Pro	Thr	Thr	Ile	Lys	35	40	45
Gln	Phe	Gly	Leu	Glu	Ala	Leu	Asp	Phe	Phe	Lys	Pro	His	Lys	Ile	Glu	50	55	60
Leu	Leu	Ile	Val	Ala	Cys	Asn	Thr	Ala	Ser	Ala	Leu	Ala	Leu	Glu	Glu	65	70	75
Met	Gln	Lys	His	Ser	Lys	Ile	Pro	Ile	Val	Gly	Val	Ile	Glu	Pro	Ser	85	90	95
Ile	Leu	Ala	Ile	Lys	Gln	Gln	Val	Lys	Asp	Lys	Asn	Ala	Pro	Ile	Leu	100	105	110
Val	Leu	Gly	Thr	Lys	Ala	Thr	Ile	Gln	Ser	Asn	Ala	Tyr	Asp	Asn	Ala	115	120	125
Leu	Lys	Gln	Gln	Gly	Tyr	Leu	Asn	Val	Ser	His	Leu	Ala	Thr	Ser	Leu	130	135	140
Phe	Val	Pro	Leu	Ile	Glu	Glu	Asn	Ile	Leu	Glu	Gly	Glu	Leu	Leu	Glu	145	150	155
Thr	Cys	Met	Arg	Tyr	Tyr	Phe	Thr	Pro	Leu	Glu	Ile	Leu	Pro	Glu	Val	165	170	175
Val	Ile	Leu	Gly	Cys	Thr	His	Phe	Pro	Leu	Ile	Ala	His	Gln	Ile	Glu	180	185	190
Gly	Tyr	Phe	Met	Glu	His	Phe	Ala	Leu	Ser	Thr	Pro	Pro	Leu	Leu	Ile	195	200	205
His	Ser	Gly	Asp	Ala	Ile	Val	Glu	Tyr	Leu	Gln	Gln	Lys	Tyr	Ala	Leu	210	215	220
Lys	Lys	Asn	Ala	Cys	Ala	Phe	Pro	Lys	Val	Glu	Phe	His	Ala	Ser	Gly	225	230	235

Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu Xaa
245 250 255

<210> 29
<211> 768
<212> DNA
<213> Helicobacter pylori

<400> 29
atgaaaatag gcgtttttga tagcgggtgtg ggaggggttta gcgtttttaaa aagcctttta 60
aaagtgcaat tatttgatga aatcatctat tatggcgata gtgctagggt gccttatggc 120
actaaagacc ccaccacgat caagcaattt ggcttagagg ctttgattt tttcaaaccg 180
cacaagattg aattattgat tgtggcatgc aacacagcga gcgctctagc tttaggagag 240
atgcaaaagt attccaaaat ccctattgtg ggcgtgattg agccaagcat tttagcgatc 300
aaacaacaag taaaagataa aaacgcccct attttagtac tagggacaaa agcgacgatt 360
cgatccaacg cttatgacaa cgccctgaaa caacaaggct atttgaatat ttcgcattta 420
gccacttctc tttttgtgcc tttgattgaa gaaaatattt tagagggcga attgctagaa 480
acttgcatgc gttattattt cactccatta gagattttac ctgaagtggg tatttttaggt 540
tgcacgcatt ttcccttgat cgctcaccaa attgagggct attttatgga gcattttgcc 600
ctttcaacgc cccccctact catccattct ggcgatgcta ttgtggaata tttgcaacaa 660
aaatacgccc ttaagaaaaa cgcatgcgca ttccctaaag tagaattcca tgcgagcggc 720
gatgtaattt ggctagaaaa acaggctaaa gaatggctca aattgtaa 768

<210> 30
<211> 256
<212> PRT
<213> Helicobacter pylori

<220>
<221> misc_feature
<222> (256)..(256)
<223> Xaa can be any naturally occurring amino acid

<400> 30

Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
1 5 10 15

Lys Ser Leu Leu Lys Val Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
20 25 30

Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
35 40 45

Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Lys Ile Glu
50 55 60

Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Gly Glu
65 70 75 80

Met Gln Lys Tyr Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
85 90 95

Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
100 105 110

Val Leu Gly Thr Lys Ala Thr Ile Arg Ser Asn Ala Tyr Asp Asn Ala
115 120 125

Leu Lys Gln Gln Gly Tyr Leu Asn Ile Ser His Leu Ala Thr Ser Leu
130 135 140

Phe Val Pro Leu Ile Glu Glu Asn Ile Leu Glu Gly Glu Leu Leu Glu
145 150 155 160

Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
165 170 175

Val Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala His Gln Ile Glu
180 185 190

Gly Tyr Phe Met Glu His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
195 200 205

His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220

Lys Lys Asn Ala Cys Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu Xaa
245 250 255

<210> 31
 <211> 768
 <212> DNA
 <213> Helicobacter pylori

```

<400> 31
atgaaaatag gcgtttttga tagcgggtgtg ggaggggttta gcgtttttaa aagcctttta      60
aaagcgcaaa tttttgatga aatcatctat tatggcgata gtgctagagt gccttatggc      120
actaaagacc ccaccacgat caagcaattt ggcttagagg ctttggattt tttcaaaccg      180
caccagattg gattattgat tgtggcatgc aacacagcga gcgctctagc tttagaagag      240
atgcaaaagc attccaaaat ccctattgtg ggtgtgattg agccaagcat tttagcgatc      300
aaacaacaag taaaagataa aaacgcccct attttagtgt tagggacaaa agcgacgatt      360
caatccaacg cttatgacaa cgccctgaaa caacaaggct atttgaacgt ttcgcattta      420
gccacttctc tttttgtgcc tttgattgaa gaaaatattt tagagggcga attgttagaa      480
acttgcatgc gttattattt cactccatta gagattttac ctgaagtggg tatttttaggt      540
tgcacgcatt ttcccttgat cgctcaccaa attgagggct attttatgga gcattttgcc      600
ctttcaacgc cccccttact catccattct ggcgatgcta ttgtggaata tttgcaacaa      660
aaatacaccc ttaagaaaaa tgcatgcgcg ttccctaaag tggaatttca tgcgagcggc      720
gatgtgggtt ggctagaaaa acaggctaaa gaatggctca aattgtaa      768
  
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<210> 32
 <211> 256
 <212> PRT
 <213> Helicobacter pylori

```

<220>
<221> misc_feature
<222> (256)..(256)
<223> Xaa can be any naturally occurring amino acid
  
```

```

<400> 32

Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
1           5           10          15

Lys Ser Leu Leu Lys Ala Gln Ile Phe Asp Glu Ile Ile Tyr Tyr Gly
          20          25          30

Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
          35          40          45
  
```

Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Gly
50 55 60

Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65 70 75 80

Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
85 90 95

Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
100 105 110

Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
115 120 125

Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
130 135 140

Phe Val Pro Leu Ile Glu Glu Asn Ile Leu Glu Gly Glu Leu Leu Glu
145 150 155 160

Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
165 170 175

Val Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala His Gln Ile Glu
180 185 190

Gly Tyr Phe Met Glu His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
195 200 205

His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Thr Leu
210 215 220

Lys Lys Asn Ala Cys Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

Asp Val Val Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu Xaa
245 250 255

<210> 33
<211> 765
<212> DNA
<213> Helicobacter pylori

```

<400> 33
atgaaaatag gcgtttttga tagcgggtgtg ggaggggttta gcgtttttaa aagcctttta 60
aaagcgcaac tatttgatga aatcatctat tatggcgata gcgctagagt gccttatggc 120
actaaagacc ccaccacgat caagcaatth ggcttagagg ctttggtttt tttcaaaccg 180
caccagatta aattattgat tgtggcatgc aacaccgcaa gcgctctggc tttagaagag 240
atgcaaaagc attccaaaat ccctgttgtg ggcgtgattg agccaagcat tttagcgatc 300
aaacggcaag tgaaagataa aaacgcccct attttggtgc tagggacaaa agcgacgatt 360
caatccaacg cctatgataa cgccctgaaa caacaaggct atttgaatgt ttcgcattta 420
gccacttctc tttttgtgcc tttgattgaa gaaagtatth tagagggcga attgctagaa 480
acttgcattc gttattatth cactccatta gagatthttac ctgaagtggc tattttaggt 540
tgcacgcatt ttcccttgat cgctcaaaaa attgagggct atthttatgga gcattttgcc 600
ctttcaacgc cccccctact catccattct ggcgatgcta ttgtggaata tttgcaacaa 660
aattacgccc ttaagaaaaa cgcattgcgcg ttccctaaag tggaatttca tgcgagcggc 720
gatgtggttt ggctagaaaa acaagctaaa gaatggctta aattg 765

```

```

<210> 34
<211> 255
<212> PRT
<213> Helicobacter pylori

```

```

<400> 34

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```

Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
1           5           10           15

```

```

Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
20           25           30

```

```

Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
35           40           45

```

```

Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Lys
50           55           60

```

```

Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65           70           75           80

```

```

Met Gln Lys His Ser Lys Ile Pro Val Val Gly Val Ile Glu Pro Ser

```


85

90

95

Ile Leu Ala Ile Lys Arg Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
 100 105 110

Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
 115 120 125

Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
 130 135 140

Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
 145 150 155 160

Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
 165 170 175

Val Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
 180 185 190

Gly Tyr Phe Met Glu His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
 195 200 205

His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Asn Tyr Ala Leu
 210 215 220

Lys Lys Asn Ala Cys Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
 225 230 235 240

Asp Val Val Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu
 245 250 255

<210> 35

<211> 29

<212> DNA

<213> Artificial primer sequence

<220>

<223> Primer used to amplify the murI gene of H. pylori using genomic DNA prepared from the J99 strain

<400> 35

aaatagtcac atgaaaatag gcgtttttg

29

<210> 36

<211> 28
 <212> DNA
 <213> Artificial primer sequence

 <220>
 <223> Primer used to amplify the murI gene of H. pylori using genomic DNA prepared from the J99 strain

 <400> 36
 agaattctat tacaatttga gccattct 28

 <210> 37
 <211> 26
 <212> DNA
 <213> Artificial primer sequence

 <220>
 <223> Primer used to amplify the groE operon of E. coli using genomic DNA prepared from E. coli strain MG1655 as the template DNA for the PCR amplification reactions

 <400> 37
 gcgaattcga tcagaatttt ttttct 26

 <210> 38
 <211> 26
 <212> DNA
 <213> Artificial primer sequence

 <220>
 <223> Primer used to amplify the groE operon of E. coli using genomic DNA prepared from E. coli strain MG1655 as the template DNA for the PCR amplification reactions

 <400> 38
 ataagtactt gtgaatctta tactag 26

 <210> 39
 <211> 858
 <212> DNA
 <213> Escherichia coli

 <400> 39
 atggctacca aactgcagga cggaataca ccttgtctgg cagctacacc ttctgaacca 60
 cgtcccaccg tgctggtggt tgactccggc gtcggtgggt tgcggtcta tgacgagatc 120
 cggcatctct taccgatctt ccattacatt tatgctttcg ataacgtcgc tttcccgtat 180
 ggcgaaaaaa gcgaagcggt tattgttgag cgagtgggtg caattgtcac cgcggtgcaa 240
 gaacgttatc cccttgcgct ggctgtgggt gcttgcaaca ctgccagtac cgtttcactt 300
 cctgcattac gcgaaaagtt cgacttcccg gttgttggtg tcgtgccggc gattaaacct 360

gctgcacgtc tgacggcaaa tggcattgtc ggattactgg caacccgcgg aacagttaaa 420
cgttcttata ctcatgagct gatcgcgctt ttcgctaatt aatgccagat agaaatgctg 480
ggctcggcag agatggttga gttggctgaa gcgaagctac atggcgaaga tgtttctctg 540
gatgcactaa aacgtatcct acgcccgtgg ttaagaatga aagagccgcc agataccggt 600
gtattggggt gcacccatct ccctctacta caagaagaac tgttacaagt gctgccagag 660
ggaacccggc tgggtgattc tggcgagcgc attgctcgcc gaacggcctg gttgttagaa 720
catgaagccc cggatgcaaa atctgccgat gcgaatattg ccttttgtat ggcaatgacg 780
ccaggagctg aacaattatt gcccgtttta cagcgttacg gcttcgaaac gctcgaaaaa 840
ctggcagttt taggctga 858

<210> 40
<211> 286
<212> PRT
<213> Escherichia coli

<220>
<221> misc_feature
<222> (286)..(286)
<223> Xaa can be any naturally occurring amino acid

<400> 40

Met Ala Thr Lys Leu Gln Asp Gly Asn Thr Pro Cys Leu Ala Ala Thr
1 5 10 15

Pro Ser Glu Pro Arg Pro Thr Val Leu Val Phe Asp Ser Gly Val Gly
20 25 30

Gly Leu Ser Val Tyr Asp Glu Ile Arg His Leu Leu Pro Asp Leu His
35 40 45

Tyr Ile Tyr Ala Phe Asp Asn Val Ala Phe Pro Tyr Gly Glu Lys Ser
50 55 60

Glu Ala Phe Ile Val Glu Arg Val Val Ala Ile Val Thr Ala Val Gln
65 70 75 80

Glu Arg Tyr Pro Leu Ala Leu Ala Val Val Ala Cys Asn Thr Ala Ser
85 90 95

Thr Val Ser Leu Pro Ala Leu Arg Glu Lys Phe Asp Phe Pro Val Val
100 105 110

Gly Val Val Pro Ala Ile Lys Pro Ala Ala Arg Leu Thr Ala Asn Gly
115 120 125

Ile Val Gly Leu Leu Ala Thr Arg Gly Thr Val Lys Arg Ser Tyr Thr
130 135 140

His Glu Leu Ile Ala Arg Phe Ala Asn Glu Cys Gln Ile Glu Met Leu
145 150 155 160

Gly Ser Ala Glu Met Val Glu Leu Ala Glu Ala Lys Leu His Gly Glu
165 170 175

Asp Val Ser Leu Asp Ala Leu Lys Arg Ile Leu Arg Pro Trp Leu Arg
180 185 190

Met Lys Glu Pro Pro Asp Thr Val Val Leu Gly Cys Thr His Phe Pro
195 200 205

Leu Leu Gln Glu Glu Leu Leu Gln Val Leu Pro Glu Gly Thr Arg Leu
210 215 220

Val Asp Ser Gly Ala Ala Ile Ala Arg Arg Thr Ala Trp Leu Leu Glu
225 230 235 240

His Glu Ala Pro Asp Ala Lys Ser Ala Asp Ala Asn Ile Ala Phe Cys
245 250 255

Met Ala Met Thr Pro Gly Ala Glu Gln Leu Leu Pro Val Leu Gln Arg
260 265 270

Tyr Gly Phe Glu Thr Leu Glu Lys Leu Ala Val Leu Gly Xaa
275 280 285

<210> 41
<211> 29
<212> DNA
<213> Artificial primer sequence

<220>
<223> Primer used to amplify the MurI gene of *E. faecalis* using genomic DNA prepared from the ATCC 29212 type strain

<400> 41
aaatagtcat atgaaaatag gcgtttttg 29

<210> 42
<211> 28
<212> DNA
<213> Artificial primer sequence

<220>
<223> Primer used to amplify the MurI gene of *E. faecalis* using genomic DNA prepared from the ATCC 29212 type strain

<400> 42
agaattctat tacaatttga gccattct 28

<210> 43
<211> 822
<212> DNA
<213> *Enterococcus faecalis*

<400> 43
atgagcaatc aagaagccat tggattaatt gattctggcg ttggtggatt aactgtttta 60
aaggaagcgc taaagcaatt accaaatgaa cgattaattt atttaggaga tacagcccgt 120
tgcccatatg gtccacgacc agccgaacaa gtcgttcagt ttacttggga aatggccgat 180
tttttattga aaaaacgaat aaaaatgcta gtaatcgcat gtaataccgc gacggctgtc 240
gcattagaag aaattaaagc tgccttgcca attccagttg ttggtggtat ttacactggc 300
gcacgagcag ccgttaaagt cacaaaaaat aacaaaattg gtgtcatagg taccttaggg 360
acaatcaaaa gtgcttccta tgaaatcgcc attaaaagta aggcaccagc aattgaggtg 420
actagtttag cttgccctaa atttgtcccc attgttgaaa gtaatcaata tcgttcttcc 480
gtagcaaaaa aaattgtggc agaaacactt caagcactac aattaaaagg acttgatagc 540
ttgatttttag gttgtaccca ttaccggttg ttacgtccgg tgattcaaaa tgtgatgggg 600
agtcattgtga cattaattga ctcaggagcc gaaacagttg gcgaagtcag catgcttctc 660
gattattttg acattgccca cagcctgaa gcgcctacac agcccatga atttataca 720
actggttctg caaaaatggt tgaagagatt gcaagcagtt ggcttggtat agagaactta 780
aaagcacaac agattcactt aggaggaaac gaaaatgatt ag 822

<210> 44
<211> 274
<212> PRT
<213> *Enterococcus faecalis*

<220>
<221> misc_feature
<222> (274)..(274)
<223> Xaa can be any naturally occurring amino acid

<400> 44

Met Ser Asn Gln Glu Ala Ile Gly Leu Ile Asp Ser Gly Val Gly Gly
1 5 10 15

Leu Thr Val Leu Lys Glu Ala Leu Lys Gln Leu Pro Asn Glu Arg Leu
20 25 30

Ile Tyr Leu Gly Asp Thr Ala Arg Cys Pro Tyr Gly Pro Arg Pro Ala
35 40 45

Glu Gln Val Val Gln Phe Thr Trp Glu Met Ala Asp Phe Leu Leu Lys
50 55 60

Lys Arg Ile Lys Met Leu Val Ile Ala Cys Asn Thr Ala Thr Ala Val
65 70 75 80

Ala Leu Glu Glu Ile Lys Ala Ala Leu Pro Ile Pro Val Val Gly Val
85 90 95

Ile Leu Pro Gly Ala Arg Ala Ala Val Lys Val Thr Lys Asn Asn Lys
100 105 110

Ile Gly Val Ile Gly Thr Leu Gly Thr Ile Lys Ser Ala Ser Tyr Glu
115 120 125

Ile Ala Ile Lys Ser Lys Ala Pro Ala Ile Glu Val Thr Ser Leu Ala
130 135 140

Cys Pro Lys Phe Val Pro Ile Val Glu Ser Asn Gln Tyr Arg Ser Ser
145 150 155 160

Val Ala Lys Lys Ile Val Ala Glu Thr Leu Gln Ala Leu Gln Leu Lys
165 170 175

Gly Leu Asp Thr Leu Ile Leu Gly Cys Thr His Tyr Pro Leu Leu Arg
180 185 190

Pro Val Ile Gln Asn Val Met Gly Ser His Val Thr Leu Ile Asp Ser

195

200

205

Gly Ala Glu Thr Val Gly Glu Val Ser Met Leu Leu Asp Tyr Phe Asp
 210 215 220

Ile Ala His Thr Pro Glu Ala Pro Thr Gln Pro His Glu Phe Tyr Thr
 225 230 235 240

Thr Gly Ser Ala Lys Met Phe Glu Glu Ile Ala Ser Ser Trp Leu Gly
 245 250 255

Ile Glu Asn Leu Lys Ala Gln Gln Ile His Leu Gly Gly Asn Glu Asn
 260 265 270

Asp Xaa

<210> 45
 <211> 801
 <212> DNA
 <213> Staphylococcus aureus

<400> 45
 atgaataaac caataggtgt aatagactct ggtgtcggag gtttgacagt agctaaagaa 60
 attatgcgtc agttgccaaa tgagacgatt tattacttag gtgatattgg gcgatgtcca 120
 tatgggccaa gaccaggaga acaagtaaaa caatatacag ttgaaatcgc tcgtaaatta 180
 atggaatttg atataaaaat gctcgtgatt gcttgtaata ctgcaactgc tgtagcttta 240
 gaatattttac aaaagacctt atcaatctca gtgattggcg taattgaacc aggtgctaga 300
 acagcaataa tgacgactag aaatcaaaat gtattagtac taggaacgga aggcacaatt 360
 aaatctgaag catatcgaac acatattaaa cgtataaatc cacatgtaga ggtacatggc 420
 gttgcctgtc caggttttgt gccacttgta gaacaaatga gatatagtga tccaacaatt 480
 acaagcattg ttattcatca aacactgaaa cgttggcgta atagtgagtc tgatactgtc 540
 attttaggat gtaccacta tccattgctc tataaaccta tctatgatta ttttggtggt 600
 aaaaagacag tgatttcgtc tggattagaa acggctcgtg aagttagtgc attgctaaca 660
 tttagtaatg aacatgcaag ttatactgaa catccagatc atcgatTTTT tgcaacaggt 720
 gataccacac atattactaa cattatcaaa gaatggctaa atttatctgt caatgtggaa 780
 cgtatatcag tgaatgacta g 801

<210> 46
<211> 267
<212> PRT
<213> Staphylococcus aureus

<220>
<221> misc_feature
<222> (267)..(267)
<223> Xaa can be any naturally occurring amino acid

<400> 46

Met Asn Lys Pro Ile Gly Val Ile Asp Ser Gly Val Gly Gly Leu Thr
1 5 10 15

Val Ala Lys Glu Ile Met Arg Gln Leu Pro Asn Glu Thr Ile Tyr Tyr
20 25 30

Leu Gly Asp Ile Gly Arg Cys Pro Tyr Gly Pro Arg Pro Gly Glu Gln
35 40 45

Val Lys Gln Tyr Thr Val Glu Ile Ala Arg Lys Leu Met Glu Phe Asp
50 55 60

Ile Lys Met Leu Val Ile Ala Cys Asn Thr Ala Thr Ala Val Ala Leu
65 70 75 80

Glu Tyr Leu Gln Lys Thr Leu Ser Ile Ser Val Ile Gly Val Ile Glu
85 90 95

Pro Gly Ala Arg Thr Ala Ile Met Thr Thr Arg Asn Gln Asn Val Leu
100 105 110

Val Leu Gly Thr Glu Gly Thr Ile Lys Ser Glu Ala Tyr Arg Thr His
115 120 125

Ile Lys Arg Ile Asn Pro His Val Glu Val His Gly Val Ala Cys Pro
130 135 140

Gly Phe Val Pro Leu Val Glu Gln Met Arg Tyr Ser Asp Pro Thr Ile
145 150 155 160

Thr Ser Ile Val Ile His Gln Thr Leu Lys Arg Trp Arg Asn Ser Glu
165 170 175

Ser Asp Thr Val Ile Leu Gly Cys Thr His Tyr Pro Leu Leu Tyr Lys
180 185 190

Pro Ile Tyr Asp Tyr Phe Gly Gly Lys Lys Thr Val Ile Ser Ser Gly
195 200 205

Leu Glu Thr Ala Arg Glu Val Ser Ala Leu Leu Thr Phe Ser Asn Glu
210 215 220

His Ala Ser Tyr Thr Glu His Pro Asp His Arg Phe Phe Ala Thr Gly
225 230 235 240

Asp Thr Thr His Ile Thr Asn Ile Ile Lys Glu Trp Leu Asn Leu Ser
245 250 255

Val Asn Val Glu Arg Ile Ser Val Asn Asp Xaa
260 265

<210> 47
<211> 822
<212> DNA
<213> Enterococcus faecium

<400> 47
atgatac gat tgacagataa tcgccctatc ggattttattg attcaggtgt cggcggccttg 60
actgtagtaa aagaagccct gaaacaatta ccgaatgaaa atatttttatt tgtaggagac 120
acagcacgct gcccatatgg ccttagaccc gcggaacagg taatccagta tacttgggaa 180
atgacggatt atctggtgga gcaaggaatc aagatgctgg tgatcgctg caataccgca 240
actgcggtgg ctttagaaga aatcaaagct gctctttcta ttccagtcac cgggtgtgatc 300
cttcccggta ctagagcggc agtaaaaaaa acacaaaata aacaagttgg cattatcggt 360
acgattggta cggtaaaaag tcaagcttat gaaaaagcac tgaaagagaa agtaccagaa 420
ttgactgtga caagtcttgc ttgtccaaaa ttgttttcag ttgtcgaaag taatgaatac 480
cattcatcgg tggcgaaaaa aattgtggca gaaacattag ctcttttaac cactaaaaaa 540
atcgatacat tgatttttggg atgcacccat tatccattat tacgccccat cattcaaaat 600
gtaatgggag aaaatgttca actgatcgat tctggagcag aaacagtagg tgaagtatct 660
atgctgttag attattttcaa tctgagcaat tcaccgcaaa atggtcggac attatgccag 720
ttttatacaa ctggctctgc caaacttttc gaggaataag ctgaagactg gcttggaatc 780

ggacacttaa atgtagaaca tatcgaattg ggaggaaaat aa

822

<210> 48
<211> 274
<212> PRT
<213> Enterococcus faecium

<220>
<221> misc_feature
<222> (274)..(274)
<223> Xaa can be any naturally occurring amino acid

<400> 48

Met Ile Arg Leu Thr Asp Asn Arg Pro Ile Gly Phe Ile Asp Ser Gly
1 5 10 15

Val Gly Gly Leu Thr Val Val Lys Glu Ala Leu Lys Gln Leu Pro Asn
20 25 30

Glu Asn Ile Leu Phe Val Gly Asp Thr Ala Arg Cys Pro Tyr Gly Pro
35 40 45

Arg Pro Ala Glu Gln Val Ile Gln Tyr Thr Trp Glu Met Thr Asp Tyr
50 55 60

Leu Val Glu Gln Gly Ile Lys Met Leu Val Ile Ala Cys Asn Thr Ala
65 70 75 80

Thr Ala Val Ala Leu Glu Glu Ile Lys Ala Ala Leu Ser Ile Pro Val
85 90 95

Ile Gly Val Ile Leu Pro Gly Thr Arg Ala Ala Val Lys Lys Thr Gln
100 105 110

Asn Lys Gln Val Gly Ile Ile Gly Thr Ile Gly Thr Val Lys Ser Gln
115 120 125

Ala Tyr Glu Lys Ala Leu Lys Glu Lys Val Pro Glu Leu Thr Val Thr
130 135 140

Ser Leu Ala Cys Pro Lys Phe Val Ser Val Val Glu Ser Asn Glu Tyr
145 150 155 160

His Ser Ser Val Ala Lys Lys Ile Val Ala Glu Thr Leu Ala Pro Leu

				165						170						175
Thr	Thr	Lys	Lys	Ile	Asp	Thr	Leu	Ile	Leu	Gly	Cys	Thr	His	Tyr	Pro	
			180					185					190			
Leu	Leu	Arg	Pro	Ile	Ile	Gln	Asn	Val	Met	Gly	Glu	Asn	Val	Gln	Leu	
		195					200					205				
Ile	Asp	Ser	Gly	Ala	Glu	Thr	Val	Gly	Glu	Val	Ser	Met	Leu	Leu	Asp	
	210					215					220					
Tyr	Phe	Asn	Leu	Ser	Asn	Ser	Pro	Gln	Asn	Gly	Arg	Thr	Leu	Cys	Gln	
225					230					235					240	
Phe	Tyr	Thr	Thr	Gly	Ser	Ala	Lys	Leu	Phe	Glu	Glu	Ile	Ala	Glu	Asp	
				245					250					255		
Trp	Leu	Gly	Ile	Gly	His	Leu	Asn	Val	Glu	His	Ile	Glu	Leu	Gly	Gly	
			260					265					270			

Lys Xaa

```

<210> 49
<211> 335
<212> DNA
<213> Enterococcus saccharolyticus

<400> 49
gcatgtaata cgcgaacggc ggtagcgtta gaagaaatta aagcgcaatt agatattcca      60
gtcgtcggtg tgatcttacc tggtagctgt gctgcagtta aagctacgaa aaatcgtcaa      120
atcgggtatta taggaacagc gggtagaatt aaaagtagtt cgtatgagca agcaattaaa      180
atgaaagtgc ctgaagcatc ggtgactagt ttagcttgtc ctaaatttgt accgattggt      240
gaaagtaatc aatttcaatc atcggtagct aaaaaaattg ttgctgagac gttattacca      300
ttgcaacata aaaaattaga tacgttgatt ttagg                                     335

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<210> 50
<211> 111
<212> PRT
<213> Enterococcus saccharolyticus

```

```

<400> 50

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Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Glu Glu Ile Lys Ala Gln
 1 5 10 15

Leu Asp Ile Pro Val Val Gly Val Ile Leu Pro Gly Thr Arg Ala Ala
 20 25 30

Val Lys Ala Thr Lys Asn Arg Gln Ile Gly Ile Ile Gly Thr Ala Gly
 35 40 45

Thr Ile Lys Ser Ser Ser Tyr Glu Gln Ala Ile Lys Met Lys Val Pro
 50 55 60

Glu Ala Ser Val Thr Ser Leu Ala Cys Pro Lys Phe Val Pro Ile Val
 65 70 75 80

Glu Ser Asn Gln Phe Gln Ser Ser Val Ala Lys Lys Ile Val Ala Glu
 85 90 95

Thr Leu Leu Pro Leu Gln His Lys Lys Leu Asp Thr Leu Ile Leu
 100 105 110

<210> 51
 <211> 344
 <212> DNA
 <213> Enterococcus mundtii

<400> 51
 gtaatcgcat gtaataccgc aactgcggtc gcattagaag aaatcaaagc aacactctcg 60
 attccagtga tcggtgtgat ttgcccagga acgagagcgg cagtcaagca gacgaaaaat 120
 catcgagtag ggggtgattgg aacaattggg accgtcaaaa gtgctgctta cgagacggca 180
 ttattggata aagcacccga actgaaagtt accagcttgg cgtgtccaaa gtttgtttca 240
 gtcgtagaaa gtaaagaata ccgatcatca gtcgctaaaa aaatcgtggc tcaaactttg 300
 cttccattag aattaaaagg gatcgatacg ttgattttag gttg 344

<210> 52
 <211> 114
 <212> PRT
 <213> Enterococcus mundtii

<400> 52

Val Ile Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Glu Glu Ile Lys
 1 5 10 15

Ala Thr Leu Ser Ile Pro Val Ile Gly Val Ile Leu Pro Gly Thr Arg
20 25 30

Ala Ala Val Lys Gln Thr Lys Asn His Arg Val Gly Val Ile Gly Thr
35 40 45

Ile Gly Thr Val Lys Ser Ala Ala Tyr Glu Thr Ala Leu Leu Asp Lys
50 55 60

Ala Pro Glu Leu Lys Val Thr Ser Leu Ala Cys Pro Lys Phe Val Ser
65 70 75 80

Val Val Glu Ser Lys Glu Tyr Arg Ser Ser Val Ala Lys Lys Ile Val
85 90 95

Ala Gln Thr Leu Leu Pro Leu Glu Leu Lys Gly Ile Asp Thr Leu Ile
100 105 110

Leu Gly

<210> 53
<211> 340
<212> DNA
<213> Enterococcus casseliflavus

<400> 53
atcgcatgta ataccgcgac agcgggtcgcc cttgaagaaa tcaaagaaca actaacgata 60
ccagtgatcg gcgtgatcct gcctggcagt cgagcagcag tcaaagcaag caaaaaccaa 120
cgaatcgggtg tcatcgggac aaacggaacg atcaaaagtg actcttataa gcgcgcgctt 180
catggcaaag cgcccatgc gtccgtcgtc agtttggtt gcccgagtt tgtgccgata 240
gtagaaagca aacaatacca tagctcggtc gccaagaaaa tcgtggcaga aacgttgcgt 300
ccattgaaaa acaaacggct agatacgttg attttaggtg 340

<210> 54
<211> 113
<212> PRT
<213> Enterococcus casseliflavus

<400> 54

Ile Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Glu Glu Ile Lys Glu
1 5 10 15

Gln Leu Thr Ile Pro Val Ile Gly Val Ile Leu Pro Gly Ser Arg Ala
20 25 30

Ala Val Lys Ala Ser Lys Asn Gln Arg Ile Gly Val Ile Gly Thr Asn
35 40 45

Gly Thr Ile Lys Ser Asp Ser Tyr Lys Arg Ala Leu His Gly Lys Ala
50 55 60

Pro His Ala Ser Val Val Ser Leu Ala Cys Pro Lys Phe Val Pro Ile
65 70 75 80

Val Glu Ser Lys Gln Tyr His Ser Ser Val Ala Lys Lys Ile Val Ala
85 90 95

Glu Thr Leu Arg Pro Leu Lys Asn Lys Arg Leu Asp Thr Leu Ile Leu
100 105 110

Gly

<210> 55
<211> 337
<212> DNA
<213> Enterococcus flavescens

<400> 55
atcgcatgta ataccgcgac agcggtcgcc cttgaagaaa tcaaagaaca actaacgata 60
ccagtgatcg gcgtgatcct gcctggcagt cgagcagcag tcaaagcaag caaaaaccaa 120
cgaatcggtg tcatcgggac aaacggaacg atcaaaagtg actcttataa gcgcgcgctt 180
catggcaaag cgcccatgc gtccgtcgtc agtttggtt gccgaagtt tgtgccgata 240
gtagaaagca aacaatacca tagctcggtc gccaagaaaa tcgtggcaga aacgttgcgt 300
ccattgaaaa acaaacggct agatacgttg atttttag 337

<210> 56
<211> 112
<212> PRT
<213> Enterococcus flavescens

<400> 56

Ile Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Glu Glu Ile Lys Glu

1	5	10	15												
Gln	Leu	Thr	Ile	Pro	Val	Ile	Gly	Val	Ile	Leu	Pro	Gly	Ser	Arg	Ala
			20					25					30		
Ala	Val	Lys	Ala	Ser	Lys	Asn	Gln	Arg	Ile	Gly	Val	Ile	Gly	Thr	Asn
		35					40					45			
Gly	Thr	Ile	Lys	Ser	Asp	Ser	Tyr	Lys	Arg	Ala	Leu	His	Gly	Lys	Ala
	50					55					60				
Pro	His	Ala	Ser	Val	Val	Ser	Leu	Ala	Cys	Pro	Lys	Phe	Val	Pro	Ile
65					70					75					80
Val	Glu	Ser	Lys	Gln	Tyr	His	Ser	Ser	Val	Ala	Lys	Lys	Ile	Val	Ala
				85					90					95	
Glu	Thr	Leu	Arg	Pro	Leu	Lys	Asn	Lys	Arg	Leu	Asp	Thr	Leu	Ile	Leu
			100					105					110		

<210> 57
 <211> 341
 <212> DNA
 <213> Enterococcus cecorum

<400> 57	
atcgcatgta ataccgcgac tgcagcagct ttaacccaaa ttaaggaaca attagacatt	60
ccagttgtcg gtgtgatttt acctggaact agagctgctg tcaaaaatac aaaatcgcaa	120
cgaattggga ttatcggcac acaaggaacc atccaaagtg gcagttatga acaagccatt	180
ctttctaaag taccgactgc tcaacctgtg agtttagcgt gtcctagatt tgttccgata	240
gtagaaagta atcaagcaaa ttcaagtgtg gcaaaaaaaaa ttgtcgctca aacactacaa	300
ccgatgacga aaaaaaacat cgatacgttg attttaggtt g	341

<210> 58
 <211> 113
 <212> PRT
 <213> Enterococcus cecorum

<400> 58
Ile Ala Cys Asn Thr Ala Thr Ala Ala Ala Leu Thr Gln Ile Lys Glu
1 5 10 15

Gln Leu Asp Ile Pro Val Val Gly Val Ile Leu Pro Gly Thr Arg Ala
20 25 30

Ala Val Lys Asn Thr Lys Ser Gln Arg Ile Gly Ile Ile Gly Thr Gln
35 40 45

Gly Thr Ile Gln Ser Gly Ser Tyr Glu Gln Ala Ile Leu Ser Lys Val
50 55 60

Pro Thr Ala Gln Pro Val Ser Leu Ala Cys Pro Arg Phe Val Pro Ile
65 70 75 80

Val Glu Ser Asn Gln Ala Asn Ser Ser Val Ala Lys Lys Ile Val Ala
85 90 95

Gln Thr Leu Gln Pro Met Thr Lys Lys Asn Ile Asp Thr Leu Ile Leu
100 105 110

Gly

<210> 59
<211> 339
<212> DNA
<213> Enterococcus raffinosus

<400> 59
atcgcattgta ataccgcgac ggcagtagct ttggaagaaa ttaaaagaac cgtagatatt 60
cccgtaatcg gtgttatata gccaggatct cgcgcagcgt taaaggcaag cgaaaatggg 120
cgcggtgggaa ttatcggaac cattggaaca gtaaaaagtg gttcttataa acacgaacta 180
caggaaaaag ctctgatac ttatgtttct agtttagcat gcccaaaatt tgtaccgatt 240
gttgaaagta atcaatttaa tagctcggtg gcgaaaaaaa ttgtttctca aacattaact 300
cctttgaaaa aggaaaagtt ggatacgttg attttaggt 339

<210> 60
<211> 113
<212> PRT
<213> Enterococcus raffinosus

<400> 60

Ile Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Glu Glu Ile Lys Arg
1 5 10 15

Thr Val Asp Ile Pro Val Ile Gly Val Ile Gln Pro Gly Ser Arg Ala
 20 25 30

Ala Leu Lys Ala Ser Glu Asn Gly Arg Val Gly Ile Ile Gly Thr Ile
 35 40 45

Gly Thr Val Lys Ser Gly Ser Tyr Lys His Glu Leu Gln Glu Lys Ala
 50 55 60

Pro Asp Thr Tyr Val Ser Ser Leu Ala Cys Pro Lys Phe Val Pro Ile
 65 70 75 80

Val Glu Ser Asn Gln Phe Asn Ser Ser Val Ala Lys Lys Ile Val Ser
 85 90 95

Gln Thr Leu Thr Pro Leu Lys Lys Glu Lys Leu Asp Thr Leu Ile Leu
 100 105 110

Gly

<210> 61
 <211> 341
 <212> DNA
 <213> Enterococcus malodoratus

<400> 61
 atcgcatgta ataccgcaac cgcagtggct ttagaagaga ttaagaagaa cgttgatatt 60
 cctgttattg gtgttatcca accaggatca cgtgctgcat taaaagcaag taaaaatagt 120
 cgtgtaggta tcatcggaac actaggaact gttaaaagtg gatcttataa acatgagctg 180
 caagaaaaag caccagaaac gtatgttgct agtctggcct gcccaaaatt tgtgccaatc 240
 gttgaaagta atcagtttaa tagttctgta gccaaaaaga ttgtttcaca atctctggca 300
 cccttaaaaa aggaaaaatt agatacgttg attttaggtt g 341

<210> 62
 <211> 113
 <212> PRT
 <213> Enterococcus malodoratus

<400> 62

Ile Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Glu Glu Ile Lys Lys
 1 5 10 15

Asn Val Asp Ile Pro Val Ile Gly Val Ile Gln Pro Gly Ser Arg Ala
20 25 30

Ala Leu Lys Ala Ser Lys Asn Ser Arg Val Gly Ile Ile Gly Thr Leu
35 40 45

Gly Thr Val Lys Ser Gly Ser Tyr Lys His Glu Leu Gln Glu Lys Ala
50 55 60

Pro Glu Thr Tyr Val Ala Ser Leu Ala Cys Pro Lys Phe Val Pro Ile
65 70 75 80

Val Glu Ser Asn Gln Phe Asn Ser Ser Val Ala Lys Lys Ile Val Ser
85 90 95

Gln Ser Leu Ala Pro Leu Lys Lys Glu Lys Leu Asp Thr Leu Ile Leu
100 105 110

Gly

<210> 63
<211> 338
<212> DNA
<213> Enterococcus solitarius

<400> 63
gcatgtaata cgcacacagc tgtggcctta gatgagatta aagagcaact gcaaattcct 60
gttgtgggag ttattatgcc gggaaccaga gcagctgtta aagcgactaa aaatcatcgt 120
attggtgtga ttggcacaaa aggaacagtt aaaagtcct cttacaaacg agcaatcaaa 180
gaaaaaatg aaaatacaaa agtaacaagt ttggcttgtc cgaagtttgt tcccattgtg 240
gaaagtaatc aaattcattc ttcagtggca aaaaaaattg tatttgaaac actattaccc 300
ttaaaaaata aacatttaga tacgttgatt ttaggttg 338

<210> 64
<211> 112
<212> PRT
<213> Enterococcus solitarius

<400> 64

Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Asp Glu Ile Lys Glu Gln

1	5	10	15
Leu Gln Ile	Pro Val Val Gly Val	Ile Met Pro Gly Thr	Arg Ala Ala
	20	25	30
Val Lys Ala	Thr Lys Asn His	Arg Ile Gly Val	Ile Gly Thr Lys Gly
	35	40	45
Thr Val Lys	Ser Ala Ser Tyr Lys	Arg Ala Ile Lys	Glu Lys Asn Glu
	50	55	60
Asn Thr Lys	Val Thr Ser Leu Ala	Cys Pro Lys Phe	Val Pro Ile Val
65	70	75	80
Glu Ser Asn	Gln Ile His Ser Ser	Val Ala Lys Lys	Ile Val Phe Glu
	85	90	95
Thr Leu Leu	Pro Leu Lys Asn Lys	His Leu Asp Thr	Leu Ile Leu Gly
	100	105	110

<210> 65
 <211> 341
 <212> DNA
 <213> Enterococcus hirae

<400> 65	
atcgcatgta ataccgctac tgcggttgct ttagaagaaa tcaaggcggc acttcctatt	60
ccagtcattg gtgtgatctt acctgggaca agagcagctg ttaaacaac aagaaataaa	120
caagtaggga ttatcggaac cctcggaacg atcaaaagtc gtgcttatga aacagcgtg	180
aaaacgaagg tacctgaact tgccgtgact agtttggtt gtccaaaatt cgtttcggtg	240
gtggaaagta atgaatatca ttcgtcagtg gcaaaaaaaaa tcgttgccca gacactagcg	300
ccattggtta ctaagaaaat cgatacgttg attttaggtt g	341

<210> 66
 <211> 113
 <212> PRT
 <213> Enterococcus hirae

<400> 66
Ile Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Glu Glu Ile Lys Ala
1 5 10 15

Ala Leu Pro Ile Pro Val Ile Gly Val Ile Leu Pro Gly Thr Arg Ala
20 25 30

Ala Val Lys Gln Thr Arg Asn Lys Gln Val Gly Ile Ile Gly Thr Leu
35 40 45

Gly Thr Ile Lys Ser Arg Ala Tyr Glu Thr Ala Leu Lys Thr Lys Val
50 55 60

Pro Glu Leu Ala Val Thr Ser Leu Ala Cys Pro Lys Phe Val Ser Val
65 70 75 80

Val Glu Ser Asn Glu Tyr His Ser Ser Val Ala Lys Lys Ile Val Ala
85 90 95

Gln Thr Leu Ala Pro Leu Val Thr Lys Lys Ile Asp Thr Leu Ile Leu
100 105 110

Gly

<210> 67
<211> 29
<212> DNA
<213> Artificial primer sequence

<220>
<223> Primer used to amplify the MurI gene of *E. faecalis* using genomic DNA prepared from the ATCC 29212 type strain of *E. faecalis* as the template DNA

<400> 67
aaatagtcac atgaaaatag gcgttttttg 29

<210> 68
<211> 28
<212> DNA
<213> Artificial primer sequence

<220>
<223> Primer used to amplify the MurI gene of *E. faecalis* using genomic DNA prepared from the ATCC 29212 type strain of *E. faecalis* as the template DNA

<400> 68
agaattctat tacaatttga gccattct 28

<210> 69

<211> 26
 <212> DNA
 <213> Artificial primer sequence

 <220>
 <223> Primer used to amplify the groE operon of E. coli using genomic DNA prepared from E. coli strain MG1655.

 <400> 69
 gcgaattcga tcagaatttt ttttct 26

 <210> 70
 <211> 26
 <212> DNA
 <213> Artificial primer sequence

 <220>
 <223> Primer used to amplify the groE operon of E. coli using genomic DNA prepared from E. coli strain MG1655.

 <400> 70
 ataagtactt gtgaatctta tactag 26

 <210> 71
 <211> 29
 <212> DNA
 <213> Artificial primer sequence

 <220>
 <223> Primer used to amplify the E. faecalis murI gene

 <400> 71
 aaaatgctag taatcgcatg taataccgc 29

 <210> 72
 <211> 26
 <212> DNA
 <213> Artificial primer sequence

 <220>
 <223> Primer used to amplify the E. faecalis murI gene

 <400> 72
 tgggtacaac ctaaaatcaa cgtatc 26

 <210> 73
 <211> 765
 <212> DNA
 <213> Aquifex pyrophilus

 <400> 73
 atgaagatag gtatctttga cagtgggtgtg gggggactta ctgttctaaa ggctataaga 60

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aatagataca gaaaggttga tatagtatac ctcggtgata ccgcaagggt tccctacggc 120
ataaggtcta aagatacgat aatcagatac tcccttgagt gtgcggggctt tttaaaggat 180
aaggggtgttg atataatcgt cgttgcctgc aataccgcaa gtgcttacgc tcttgaacgt 240
ttaaagaaag agataaacgt tcccgttttc ggcgttattg aaccgggggt taaagaagcc 300
ttaaaaaagt caaggaataa aaaaatagga gttataggaa ctctgcaac cgtaaaaagc 360
ggagcctacc agagaaagct tgaagagggg ggagctgatg tttttgcaa ggctgtccc 420
ctattcgttc cccttgcgga ggaaggtctc cttgaggggg agataacaag aaaggttgta 480
gaacactacc ttaaggagtt taaaggtaag attgatactc tgattttagg atgtacccat 540
taccaccttc ttaaaaagga gataaagaag tttttgggag acgttgaagt cgttgactct 600
tccgaagccc ttccctttc cctccataac ttataaagg acgatgggtc ctcatccctt 660
gagttatfff ttacggacct ttcccaaatt ctccagtttt tgattaaatt aatactcggt 720
agggattacc cggtaaaact tgcggagggg gtttttacac attaa 765

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<210> 74
<211> 255
<212> PRT
<213> Aquifex pyrophilus

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<220>
<221> misc_feature
<222> (255)..(255)
<223> Xaa can be any naturally occurring amino acid

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<400> 74
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Met Lys Ile Gly Ile Phe Asp Ser Gly Val Gly Gly Leu Thr Val Leu
1           5           10           15

```

```

Lys Ala Ile Arg Asn Arg Tyr Arg Lys Val Asp Ile Val Tyr Leu Gly
          20           25           30

```

```

Asp Thr Ala Arg Val Pro Tyr Gly Ile Arg Ser Lys Asp Thr Ile Ile
          35           40           45

```

```

Arg Tyr Ser Leu Glu Cys Ala Gly Phe Leu Lys Asp Lys Gly Val Asp
          50           55           60

```

```

Ile Ile Val Val Ala Cys Asn Thr Ala Ser Ala Tyr Ala Leu Glu Arg
65           70           75           80

```

Leu Lys Lys Glu Ile Asn Val Pro Val Phe Gly Val Ile Glu Pro Gly
85 90 95

Val Lys Glu Ala Leu Lys Lys Ser Arg Asn Lys Lys Ile Gly Val Ile
100 105 110

Gly Thr Pro Ala Thr Val Lys Ser Gly Ala Tyr Gln Arg Lys Leu Glu
115 120 125

Glu Gly Gly Ala Asp Val Phe Ala Lys Ala Cys Pro Leu Phe Val Pro
130 135 140

Leu Ala Glu Glu Gly Leu Leu Glu Gly Glu Ile Thr Arg Lys Val Val
145 150 155 160

Glu His Tyr Leu Lys Glu Phe Lys Gly Lys Ile Asp Thr Leu Ile Leu
165 170 175

Gly Cys Thr His Tyr Pro Leu Leu Lys Lys Glu Ile Lys Lys Phe Leu
180 185 190

Gly Asp Val Glu Val Val Asp Ser Ser Glu Ala Leu Ser Leu Ser Leu
195 200 205

His Asn Phe Ile Lys Asp Asp Gly Ser Ser Ser Leu Glu Leu Phe Phe
210 215 220

Thr Asp Leu Ser Pro Asn Leu Gln Phe Leu Ile Lys Leu Ile Leu Gly
225 230 235 240

Arg Asp Tyr Pro Val Lys Leu Ala Glu Gly Val Phe Thr His Xaa
245 250 255

<210> 75
<211> 19
<212> DNA
<213> Artificial Primer Sequence

<220>
<223> Primer used to amplify the MurI gene of *S. aureus* using genomic
DNA prepared from the ATCC 25923 type strain of *S. aureus*

<400> 75
tgatgcaaca aatggacga

<210> 76
<211> 18
<212> DNA
<213> Artificial primer sequence

<220>
<223> Primer used to amplify the MurI gene of *S. aureus* using genomic DNA prepared from the ATCC 25923 type strain of *S. aureus*

<400> 76
ttacaatttg agccattc 18

<210> 77
<211> 62
<212> PRT
<213> *Staphylococcus aureus*

<400> 77

Ile Leu Pro Gly Ala Arg Ala Ala Val Lys Val Thr Lys Asn Asn Lys
1 5 10 15

Ile Gly Val Ile Gly Thr Leu Gly Thr Ile Lys Ser Ala Ser Tyr Asp
20 25 30

Ile Ala Ile Lys Ser Lys Ala Pro Ala Ile Glu Val Thr Ser Leu Ala
35 40 45

Cys Pro Lys Phe Val Pro Ile Val Glu Ser Asn Gln Tyr Arg
50 55 60

<210> 78
<211> 62
<212> PRT
<213> *Enterococcus faecalis*

<400> 78

Ile Glu Pro Gly Ala Arg Thr Ala Ile Met Thr Thr Arg Asn Gln Asn
1 5 10 15

Val Leu Val Leu Gly Thr Glu Gly Thr Ile Lys Ser Glu Ala Tyr Arg
20 25 30

Thr His Ile Lys Arg Ile Asn Pro His Val Glu Val His Gly Val Ala
35 40 45

Cys Pro Gly Phe Val Pro Leu Val Glu Gln Met Arg Tyr Ser

50

55

60

<210> 79
 <211> 49
 <212> PRT
 <213> Staphylococcus aureus

<400> 79

Ser Val Ala Lys Lys Ile Val Ala Glu Thr Leu Gln Ala Leu Gln Leu
 1 5 10 15

Lys Gly Leu Asp Thr Leu Ile Leu Gly Cys Thr His Tyr Pro Leu Leu
 20 25 30

Arg Pro Val Ile Gln Asn Val Met Gly Ser His Val Thr Leu Ile Asp
 35 40 45

Ser

<210> 80
 <211> 49
 <212> PRT
 <213> Enterococcus faecalis

<400> 80

Thr Val Ile Ser Ile Val Ile His Gln Thr Leu Lys Arg Trp Arg Asn
 1 5 10 15

Ser Glu Ser Asp Thr Val Ile Leu Gly Cys Thr His Tyr Pro Leu Leu
 20 25 30

Tyr Lys Pro Ile Tyr Asp Tyr Phe Gly Gly Lys Lys Thr Val Ile Ser
 35 40 45

Ser

<210> 81
 <211> 62
 <212> PRT
 <213> Staphylococcus aureus

<400> 81

Ile Leu Pro Gly Thr Arg Ala Ala Val Lys Lys Thr Gln Asn Lys Gln

1 5 10 15
 Val Gly Ile Ile Gly Thr Ile Gly Thr Val Lys Ser Gln Ala Tyr Glu
 20 25 30
 Lys Ala Leu Lys Glu Lys Val Pro Glu Leu Thr Val Thr Ser Leu Ala
 35 40 45
 Cys Pro Lys Phe Val Ser Val Val Glu Ser Asn Glu Tyr His
 50 55 60

<210> 82
 <211> 62
 <212> PRT
 <213> Enterococcus faecalis

<400> 82
 Ile Glu Pro Gly Ala Arg Thr Ala Ile Met Thr Thr Arg Asn Gln Asn
 1 5 10 15

Val Leu Val Leu Gly Thr Glu Gly Thr Ile Lys Ser Glu Ala Tyr Arg
 20 25 30
 Thr His Ile Lys Arg Ile Asn Pro His Val Glu Val His Gly Val Ala
 35 40 45

Cys Pro Gly Phe Val Pro Leu Val Glu Gln Met Arg Tyr Ser
 50 55 60

<210> 83
 <211> 15
 <212> PRT
 <213> Staphylococcus aureus

<400> 83
 Ser Val Ala Lys Lys Ile Val Ala Glu Thr Leu Ala Pro Leu Thr
 1 5 10 15

<210> 84
 <211> 15
 <212> PRT
 <213> Enterococcus faecalis

<400> 84
 Thr Val Ile Ser Ile Val Ile His Gln Thr Leu Lys Arg Trp Arg

1 5 10 15

<210> 85
<211> 32
<212> PRT
<213> Staphylococcus aureus

<400> 85

Lys Lys Ile Asp Thr Leu Ile Leu Gly Cys Thr His Tyr Pro Leu Leu
1 5 10 15

Arg Pro Ile Ile Gln Asn Val Met Gly Glu Asn Val Gln Leu Ile Asp
20 25 30

<210> 86
<211> 32
<212> PRT
<213> Enterococcus faecalis

<400> 86

Ser Glu Ser Asp Thr Val Ile Leu Gly Cys Thr His Tyr Pro Leu Leu
1 5 10 15

Tyr Lys Pro Ile Tyr Asp Tyr Phe Gly Gly Lys Lys Thr Val Ile Ser
20 25 30

<210> 87
<211> 111
<212> PRT
<213> Staphylococcus aureus

<400> 87

Ile Leu Pro Gly Thr Arg Ala Ala Val Lys Lys Thr Gln Asn Lys Gln
1 5 10 15

Val Gly Ile Ile Gly Thr Ile Gly Thr Val Lys Ser Gln Ala Tyr Glu
20 25 30

Lys Ala Leu Lys Glu Lys Val Pro Glu Leu Thr Val Thr Ser Leu Ala
35 40 45

Cys Pro Lys Phe Val Ser Val Val Glu Ser Asn Glu Tyr His Ser Ser
50 55 60

Val Ala Lys Lys Ile Val Ala Glu Thr Leu Ala Pro Leu Thr Thr Lys

65 70 75 80

Lys Ile Asp Thr Leu Ile Leu Gly Cys Thr His Tyr Pro Leu Leu Arg
 85 90 95

Val Leu Val Leu Gly Thr Glu Gly Thr Ile Lys Ser Glu Ala Tyr Arg
20 25 30

Thr His Ile Lys Arg Ile Asn Pro His Val Glu Val His Gly Val Ala
35 40 45

Cys Pro Gly Phe Val Pro Leu Val Glu Gln Met Arg Tyr Ser Asp
50 55 60

<210> 90
<211> 63
<212> PRT
<213> Enterococcus faecalis

<400> 90

Ile Leu Pro Gly Ala Arg Ala Ala Val Lys Val Thr Lys Asn Asn Lys
1 5 10 15

Ile Gly Val Ile Gly Thr Leu Gly Thr Ile Lys Ser Ala Ser Tyr Asp
20 25 30

Ile Ala Ile Lys Ser Lys Ala Pro Ala Ile Glu Val Thr Ser Leu Ala
35 40 45

Cys Pro Lys Phe Val Pro Ile Val Glu Ser Asn Gln Tyr Arg Ser
50 55 60

<210> 91
<211> 63
<212> PRT
<213> Enterococcus faecalis

<400> 91

Ile Leu Pro Gly Thr Arg Ala Ala Val Lys Lys Thr Gln Asn Lys Gln
1 5 10 15

Val Gly Ile Ile Gly Thr Ile Gly Thr Val Lys Ser Gln Ala Tyr Glu
20 25 30

Lys Ala Leu Lys Glu Lys Val Pro Glu Leu Thr Val Thr Ser Leu Ala
35 40 45

Cys Pro Lys Phe Val Ser Val Val Glu Ser Asn Glu Tyr His Ser
50 55 60

<210> 92
<211> 15
<212> PRT
<213> Staphylococcus aureus

<400> 92

Thr	Val	Ile	Ser	Ile	Val	Ile	His	Gln	Thr	Leu	Lys	Arg	Trp	Arg
1				5					10					15

<210> 93
<211> 15
<212> PRT
<213> Enterococcus faecalis

<400> 93

Ser	Val	Ala	Lys	Lys	Ile	Val	Ala	Glu	Thr	Leu	Gln	Ala	Leu	Gln
1				5					10					15

<210> 94
<211> 15
<212> PRT
<213> Enterococcus faecalis

<400> 94

Ser	Val	Ala	Lys	Lys	Ile	Val	Ala	Glu	Thr	Leu	Ala	Pro	Leu	Thr
1				5					10					15

<210> 95
<211> 32
<212> PRT
<213> Staphylococcus aureus

<400> 95

Ser	Glu	Ser	Asp	Thr	Val	Ile	Leu	Gly	Cys	Thr	His	Tyr	Pro	Leu	Leu
1				5					10					15	

Tyr	Lys	Pro	Ile	Tyr	Asp	Tyr	Phe	Gly	Gly	Lys	Lys	Thr	Val	Ile	Ser
			20					25					30		

<210> 96
<211> 32
<212> PRT
<213> Enterococcus faecalis

<400> 96

Lys	Gly	Leu	Asp	Thr	Leu	Ile	Leu	Gly	Cys	Thr	His	Tyr	Pro	Leu	Leu
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

1

5

10

15

Arg Pro Val Ile Gln Asn Val Met Gly Ser His Val Thr Leu Ile Asp
20 25 30

<210> 97

<211> 32

<212> PRT

<213> Enterococcus faecalis

<400> 97

Lys Lys Ile Asp Thr Leu Ile Leu Gly Cys Thr His Tyr Pro Leu Leu
1 5 10 15

Arg Pro Ile Ile Gln Asn Val Met Gly Glu Asn Val Gln Leu Ile Asp
20 25 30